Weather Louvre Test

L.050IM2

Carried out for

nv Renson Ventilation sa

Report 61220/4

Compiled by Paul Ainscoe

5 December 2018

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Weather Louvre Test

L.050IM2

Carried out for: nv Renson Ventilation sa
Maalbeekstraat 10
8790 - Waregem
Belgium

Contract: Report 61220/4

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QUALITY ASSURANCE

Issue	Date	Compiled by:	Approved by:	Signature
Draft	*05-Dec-2018*	*Paul Ainscoe*	*Mark Roper*	
		Test Engineer	*Principal Test Engineer*	

CONTENTS

FIGURES

APPENDICES

1 INTRODUCTION

This report concerns tests conducted on a louvre to determine the Rainwater Penetration and the Pressure Drop versus Airflow Curves, with the associated Coefficients of Discharge and Entry, using the test methods contained within EN 13030:2001. It should be noted that BS EN 13030:2001 simply provides a method for testing and rating louvre samples, there are no minimum permitted values or recommendations for louvre performance.
The work was commissioned by nv Renson Ventilation sa and was carried out at BSRIA North on 22 to 24 August 2018.

Items received for test

Test Item	BSRIA ID
L.050IM2	61220A4

1.1 TEST ITEM INFORMATION

Contract		61220
Date		20-8-18
Manufacturer		nv Renson Ventilation sa
Louvre Model		L.050IM2
Material		Aluminium
Painted		No
Core Area Height		975 mm
Core Area Width		995 mm
Blade Pack Depth		41 mm
Frame Depth		50 mm
No. of Blades		19
Blade Pitch		50 mm
Blade Angle		45° approx.
No. of Banks		1
Guard Type		None
Guard Spacing		N/A
Side Channels		No
Water Drip Tray		No
Blade Orientation		Horizontal

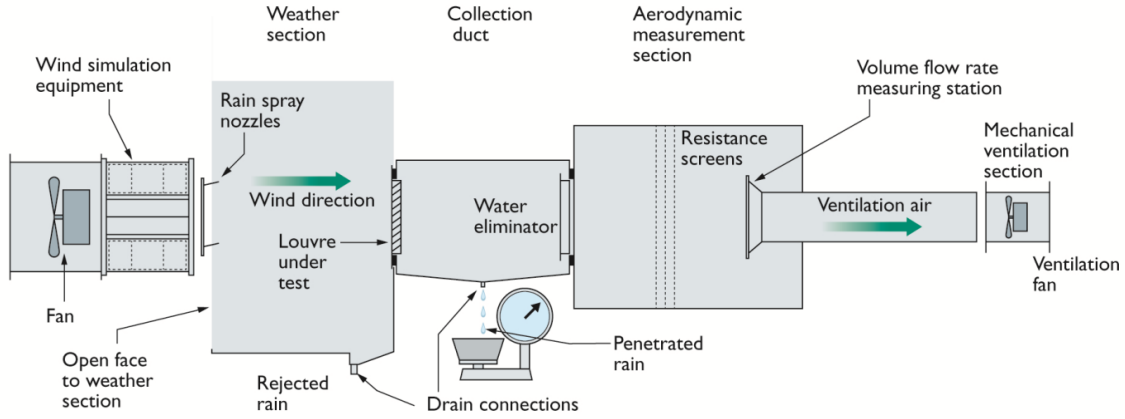
Note: Weather louvre core area - product of the minimum height H and minimum width W of the front opening in the weather louvre assembly with the louvre blades removed
Blade Pack Depth refers to the distance from front of first bank to rear of last bank.

Figure 1 Test item 61220A4 (front)

Figure 2 Test item 61220A4 (rear)

2 TEST METHOD

A schematic representation of the rig used during testing



The test comprises of two parts:

2.1 WATER PENETRATION

The weather louvre is subjected to fan driven wind at a speed of 13 m/s and water sprayed as rainfall at a rate of 75 l/h. In addition to the simulated wind and rain, air is drawn through the louvre at various set velocities (0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0 and 3.5 m/s).
Each test is preceded by a suitable 'pre-test' soak which is typically around 30 minutes. Each test is run until the results become stable, and in any case, for a minimum of 30 minutes.
The penetrated water is collected in the collection duct and is measured and recorded against time elapsed.
A range of measurements are taken to give the characteristic curve for the test louvre.

2.2 PRESSURE DROP

For this test, the Aerodynamic Measuring Section (AMS) is separated from the main rig. The louvre is then mounted in the upstream opening of the AMS.
Pressure tappings in the plenum walls of the AMS allow measurement of the static pressure within the plenum during testing. The airflow volume is calculated from the differential pressure at the measuring cones. The plenum has a set of settling screens within to produce even flow through the cones and therefore gives an accurate reading of the total volume.
By adjusting the fan speed, the total airflow through the system varies and therefore changes the pressure on the louvre under test. A range of measurements are taken to give the characteristic curve for the test louvre.

2.3 TEST EQUIPTMENT USED

Test equipment	BSRIA ID	Calibration Expiry Date
Water supply measurement	352	19-4-19
Rain measuring system	353	20-4-19
Airflow cones	364	17-1-19
Micromanometer	1600	21-12-18
Micromanometer	1601	21-12-18
Scales (water)	1599	26-6-19
Flow meter	1688	29-5-19

3 RESULTS

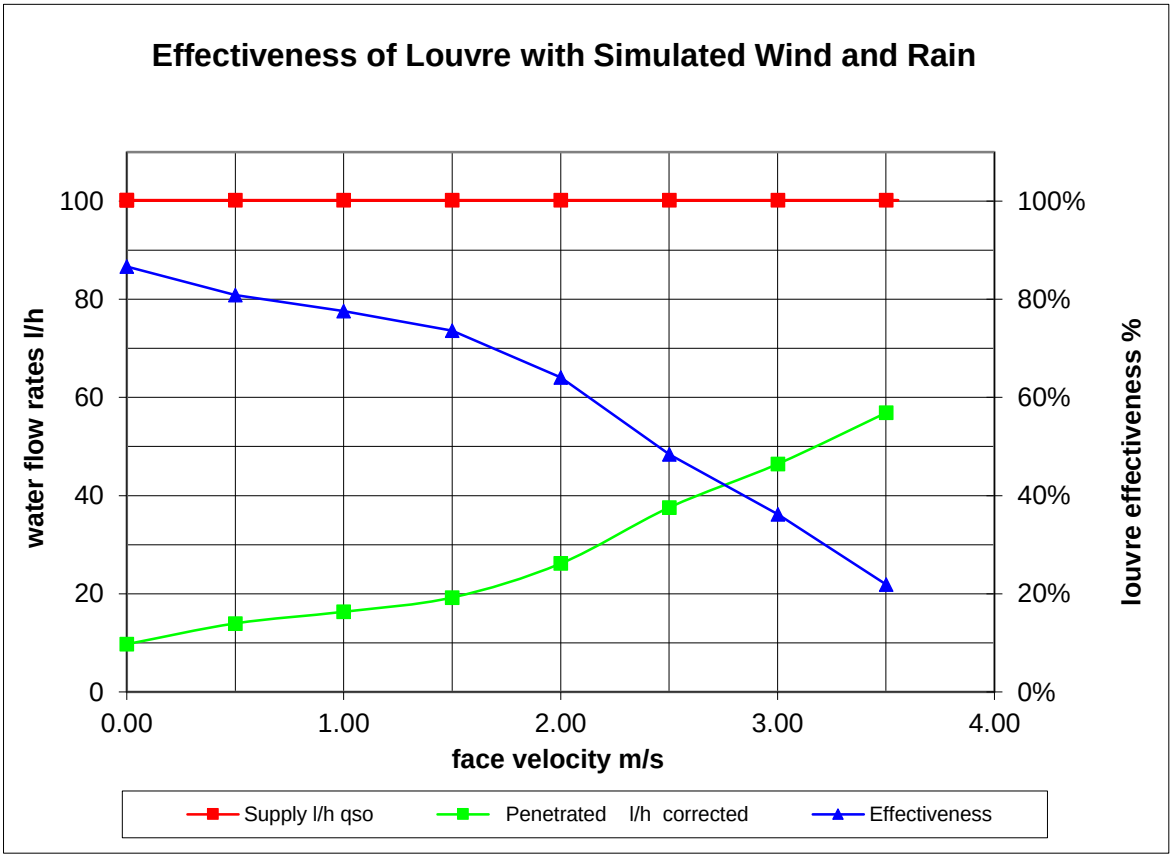
3.1 RAINWATER PENETRATION

MANUFACTURER nv Renson Ventilation sa Date 22/08/2018
MODEL L.050IM2 Contract 61220

Simulated rainfall 75 mm/hr
Wind speed 13.0 m/s

louvre height 975 mm
louvre width 995 mm
louvre area 0.970 m^2

VENTILATION RATE		WATER FLOW RATES		Effectiveness	Class
Volume m^3/s	Velocity m/s	Supply l/h	Penetrated l/h		
0.00	0.00	100.2	9.7	86.6%	C
0.49	0.50	100.2	13.9	80.8%	C
0.97	1.00	100.2	16.3	77.6%	D
1.45	1.50	100.2	19.2	73.6%	D
1.94	2.00	100.2	26.2	64.0%	D
2.43	2.50	100.2	37.5	48.4%	D
2.91	3.00	100.2	46.4	36.2%	D
3.40	3.50	100.2	56.8	21.9%	D

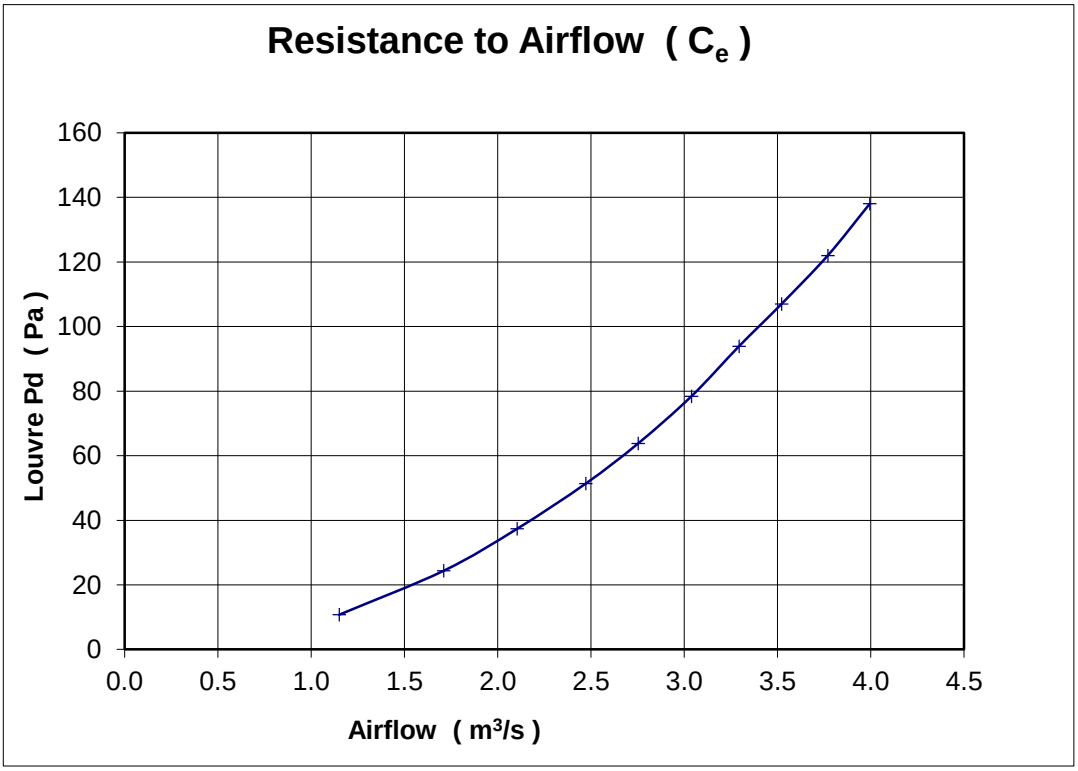


3.2 COEFFICENT OF ENTRY

MANUFACTURER nv Renson Ventilation sa Date 24/08/2018
MODEL L.050IM2 Contract 61220

air temperature	17.3	°C	louvre height	975	mm
barometer	1006	mbar	louvre width	995	mm
air density	1.201	kg/m^3	louvre area	0.970	m^2

	louvre face velocity	air flow rate		
louvre pd Pascals	m/s	test m^3/s	theoretical m^3/s	coefficient C_e
10.8	1.19	1.151	4.114	0.280
24.4	1.76	1.711	6.183	0.277
37.4	2.17	2.105	7.655	0.275
51.4	2.55	2.473	8.975	0.276
63.8	2.84	2.753	9.999	0.275
78.4	3.13	3.039	11.084	0.274
93.9	3.40	3.295	12.130	0.272
107.0	3.63	3.523	12.949	0.272
122.0	3.89	3.771	13.827	0.273
138.0	4.12	3.996	14.705	0.272
			mean C_e	0.274
			Class	3



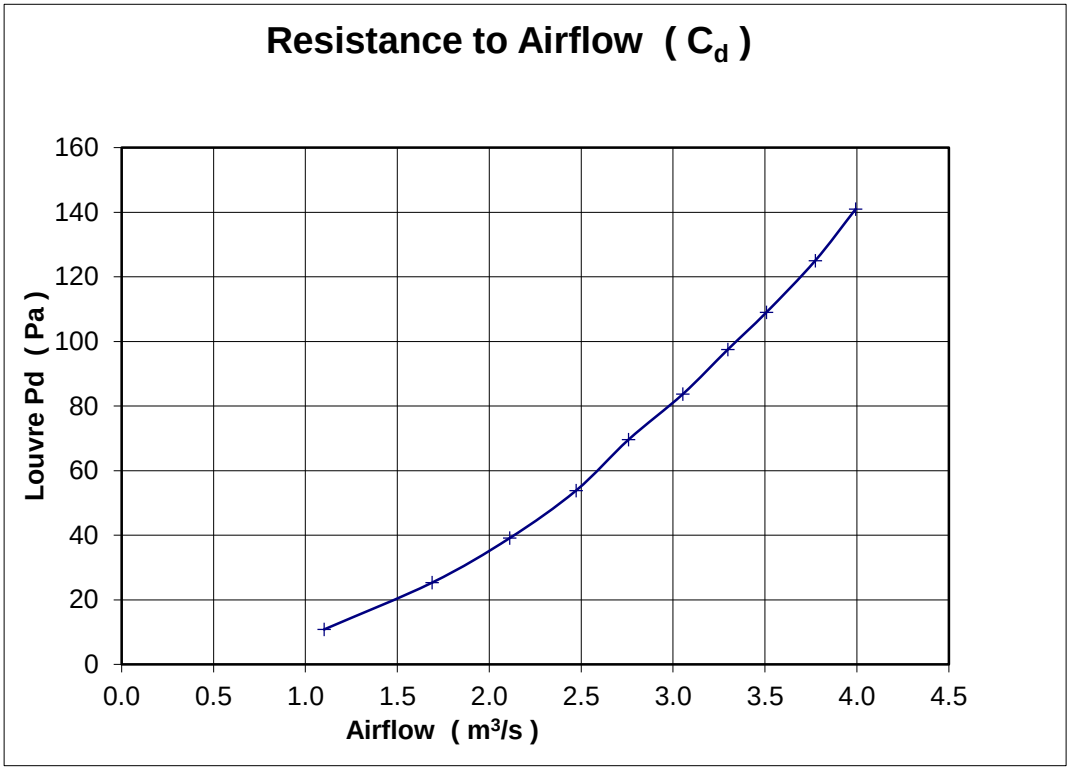
A 'trendline' for the above graph would follow $y = 8.111x^{2.0453}$

3.3 COEFFICENT OF DISCHARGE

MANUFACTURER nv Renson Ventilation sa Date 24/08/2018
MODEL L.050IM2 Contract 61220

air temperature	17.1	°C	louvre height	975	mm
barometer	1006	mbar	louvre width	995	mm
air density	1.202	kg/m^3	louvre area	0.970	m^2

	louvre face velocity	air flow rate		
louvre pd Pascals	m/s	test m^3/s	theoretical m^3/s	coefficient C_d
10.8	1.14	1.101	4.112	0.268
25.3	1.74	1.689	6.294	0.268
39.1	2.18	2.111	7.825	0.270
53.8	2.55	2.472	9.179	0.269
69.6	2.84	2.758	10.440	0.264
83.7	3.15	3.054	11.449	0.267
97.5	3.40	3.298	12.356	0.267
109.0	3.62	3.508	13.065	0.269
125.0	3.89	3.774	13.991	0.270
141.0	4.12	3.994	14.859	0.269
			mean C_d	0.268
			Class	3



A 'trendline' for the above graph would follow y = 8.8899x^2

APPENDIX A: MANUFACTURERS DRAWING